

WHAT IS CLAIMED IS:

1. A separator for use in a fuel cell that generates electricity by a reaction between fuel and oxidant, wherein the separator is formed by a porous metal material which is impregnated with resin, and wherein gas flow passages are formed on a contact surface for contacting with an electrode that is provided in the fuel cell, and conductive plating is applied on parts where the porous metal material is exposed in the contact surface.

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2. A separator for use in a fuel cell according to claim 1, wherein said porous metal material is metal foam.

3. A separator for use in a fuel cell according to claim 1, wherein a conductive fiber aggregated material is used instead of the porous metal.

4. A separator for use in a fuel cell according to claim 1, wherein said contact surface is smoothed by machining and thereafter the conductive plating is applied on the parts where the porous metal material is exposed.

5. A separator for use in a fuel cell according to claim 2, wherein said contact surface is smoothed by machining and thereafter the conductive plating is applied on the parts where the porous metal material is exposed.

6. A separator for use in a fuel cell according to claim 3, wherein said contact surface is smoothed by machining and thereafter the conductive plating is applied on the parts where
5 the porous metal material is exposed.

7. A separator for use in a fuel cell according to claim 1, further comprising a structure retaining part in which is provided through openings for supplying the gas flow passages with
10 fluid, and wherein the structure retaining part is continuously formed around the porous metal material by the resin used for impregnation.

8. A separator for use in a fuel cell according to claim
15 2, further comprising a structure retaining part in which is provided through openings for supplying the gas flow passages with fluid, and wherein the structure retaining part is continuously formed around the metal foam by the resin used for impregnation.

20 9. A separator for use in a fuel cell according to claim 3, further comprising a structure retaining part in which is provided through openings for supplying the gas flow passages with fluid, and wherein the structure retaining part is continuously formed around the conductive fiber aggregated material by the resin
25 used for impregnation.

10. A separator for use in a fuel cell according to claim 4, further comprising a structure retaining part in which is provided through openings for supplying the gas flow passages with fluid, and wherein the structure retaining part is continuously
5 formed around the porous metal material by the resin used for impregnation.

11. A separator for use in a fuel cell according to claim 5, further comprising a structure retaining part in which is
10 provided through openings for supplying the gas flow passages with fluid, and wherein the structure retaining part is continuously formed around the porous metal by the resin used for impregnation.

12. A separator for use in a fuel cell according to claim
15 6, further comprising a structure retaining part in which is provided through openings for supplying the gas flow passages with fluid, and wherein the structure retaining part is continuously formed around the conductive fiber aggregated material by the resin used for impregnation.

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13. A fuel cell comprising the separator of claim 1.

14. A fuel cell comprising the separator of claim 2.

25 15. A fuel cell comprising the separator of claim 3.

16. A fuel cell comprising the separator of claim 4.

17. A fuel cell comprising the separator of claim 7.

5 18. A method of producing a separator for use in a fuel cell, comprising the steps of:

forming a separator by a material wherein cavities of a porous metal material are impregnated with resin;

forming gas flow passages on a contact surface for contacting
10 with an electrode that is provided in the fuel cell;

smoothing the contact surface by machining to provide a smooth surface with the porous metal material exposed in the contact surface; and

applying conductive plating on exposed parts of the porous
15 metal material.

19. A method of producing a separator for use in a fuel cell according to claim 18, wherein said porous metal material is metal foam.

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20. A method of producing a separator for use in a fuel cell according to claim 20, wherein a conductive fiber aggregated material is used instead of the porous metal.